

## CLAIMS

1. An ultrasonic diagnostic system, comprising:
  - 5 electroacoustic conversion means in which a plurality of sub-arrays, each composed of a plurality of electroacoustic transducers, are arranged at least two-dimensionally;
  - 10 a sub-beam former that is provided on the sub-array basis, generates signals having different polarities with respect to a received signal from the electroacoustic transducer in the sub-array, obtains a first signal and a second signal by controlling amplitudes of the signals having different polarities of each electroacoustic transducer in the sub-array, followed by adding, imparts a delay time difference corresponding to a quarter of one period of the received signal between the first signal and the second signal by delay means provided inside, and adds the first signal and the second signal to which the delay time difference is imparted; and
  - 15 a main beam former for subjecting a signal output from the sub-beam former to delay addition.
2. The ultrasonic diagnostic system according to claim 1, wherein the delay means is capable of switching the delay time difference between a quarter of one period of a fundamental of the received signal and a quarter of one period of a harmonic of the received signal.
- 25 3. The ultrasonic diagnostic system according to claim 1, wherein the delay means imparts a delay time corresponding to a quarter of one period of the received signal to one of the first signal and the second signal.
4. An ultrasonic diagnostic system, comprising:
  - 30 electroacoustic conversion means in which a plurality of sub-arrays each composed of a plurality of electroacoustic transducers are arranged at

least two-dimensionally;

5 a sub-beam former that is provided on the sub-array basis, generates signals having different polarities with respect to a received signal from the electroacoustic transducer in the sub-array, and obtains a first signal and a second signal by controlling amplitudes of the signals having different polarities of each electroacoustic transducer in the sub-array, followed by adding, imparts a predetermined phase shift amount to one of the first signal and the second signal by phase shift means provided inside, and adds the first signal or the second signal to which the predetermined phase shift amount is imparted to each other; and

10 a main beam former for subjecting a signal output from the sub-beam former to delay addition.

15 5. The ultrasonic diagnostic system according to claim 4, wherein the phase shift means is composed of phase shift circuits in two stages, each having a phase shift amount of 45 degrees, and each of the phase shift circuits in two stages is configured so as to include a capacitor and a resistor.

6. An ultrasonic diagnostic system, comprising:

20 electroacoustic conversion means in which a plurality of sub-arrays each composed of a plurality of electroacoustic transducers are arranged at least two-dimensionally;

25 parallel adding means that is provided on the sub-array basis, generates signals having different polarities with respect to a received signal from the electroacoustic transducer in the sub-array, and obtains a first signal and a second signal by controlling amplitudes of the signals having different polarities of each electroacoustic transducer in the sub-array, followed by adding;

30 a first main beam former for subjecting a first signal added by the parallel adding means to delay addition;

a second main beam former for subjecting a second signal added by the parallel adding means to delay addition;

5 delay means for imparting a delay time difference corresponding to a quarter of one period of the received signal between an output signal of the first main beam former and an output signal of the second main beam former; and

adding means for adding an output signal of the first main beam former and an output signal of the second main beam former, to which the delay time difference is imparted by the delay means.

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7. An ultrasonic diagnostic system, comprising:

electroacoustic conversion means in which a plurality of sub-arrays each composed of a plurality of electroacoustic transducers are arranged at least two-dimensionally;

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parallel adding means that is provided on the sub-array basis, generates signals having different polarities with respect to a received signal from the electroacoustic transducer in the sub-array, and obtains a first signal and a second signal by controlling amplitudes of the signals having different polarities of each electroacoustic transducer in the sub-array,

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followed by adding;

a first main beam former for subjecting a first signal added by the parallel adding means to delay addition;

a second main beam former for subjecting a second signal added by the parallel adding means to delay addition;

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phase shift means for imparting a phase difference of 90 degrees between an output signal of the first main beam former and an output signal of the second main beam former; and

adding means for adding an output signal of the first main beam former and an output signal of the second main beam former, to which the phase difference of 90 degrees is imparted by the phase shift means.